

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended) A liner for a hydrothermal pressure vessel, said vessel having a wall defining a chamber and said liner comprising:

a porous layer positioned in said chamber of said vessel;

a non-porous layer positioned against said porous layer with said porous layer between said non-porous layer and said wall of said vessel;

a seal for coupling said non-porous layer to said wall to encapsulate said porous layer therebetween; [[and]]

[[means]] a connector for establishing fluid communication with said porous material layer; and

a pump in fluid communication with said connector.

2. (Original) A liner as recited in claim 1 further comprising at least one connector extending through said wall and into contact with said porous layer for conveying operational information from said porous layer.

3. (Original) A liner as recited in claim 2 further comprising a pressure sensor for determining the pressure in said porous layer.

4. (Original) A liner as recited in claim 2 further comprising a chemical species sensor for determining the presence of a chemical species in said porous layer.

5. (Original) A liner as recited in claim 2 further comprising a flow sensor for determining the flow in said porous layer.

6. (Original) A liner as recited in claim 1 further comprising at least one partition positioned between said non-porous layer and said wall for dividing said porous layer into sections and for isolating said sections from each other.

7. (Original) A liner as recited in claim 1 wherein said porous layer is positioned adjacent said wall of said vessel.

8. (Original) A liner as recited in claim 1 further comprising an insulation layer positioned adjacent said wall of said vessel between said porous layer and said wall of said vessel.

9. (Currently Amended) A liner as recited in claim 1 wherein said ~~means in fluid communication with said porous layer for pumping a heat transfer fluid therethrough~~ comprises connector is a first connector for allowing ~~[[said]]~~ a heat transfer fluid to flow into said porous layer, and said liner further comprises a second connector in fluid communication with said pump for allowing said heat transfer fluid to flow out of said porous layer ~~and a pump in fluid communication with said first connector.~~

10. (Original) A liner as recited in claim 1 further comprising a sensor for performing leak detection measurements, said sensor embedded in said porous layer for passing a signal through said wall.

11. (Original) A liner for a hydrothermal pressure vessel, said vessel having a wall defining a chamber and said liner comprising:

a porous layer positioned in said chamber of said vessel;

a non-porous layer positioned against said porous layer with said porous layer between said non-porous layer and said wall of said vessel;

a seal for coupling said non-porous layer to said wall to encapsulate said porous layer therebetween;

a partition positioned between said non-porous layer and said wall for dividing said porous layer into a first section and a second section and for isolating said sections from each other;

means in fluid communication with said first section of said porous layer for selectively pumping a heat transfer fluid therethrough; and

means for establishing fluid communication with said second section of said porous layer.

12. (Original) A liner as recited in claim 11 further comprising a first connector extending through said wall and into contact with said first section of said porous layer for conveying operational information from said first section of said porous layer and a second connector extending through said wall and into contact with said second section of said porous layer for conveying operational information from said second section of said porous layer.

Claims 13-20 (Canceled)

21. (New) A system for hydrothermal treatment of a reactant comprising:

a vessel, said vessel having a wall and defining a chamber, said wall having a liner formed with a porous layer and a non-porous layer, said non-porous layer sealed to said wall to encapsulate said porous layer therebetween;

a means for introducing the reactant, an oxidizer and water into said chamber;

a means for converting said reactant into reaction products by combining said reactant, said oxidizer and said water together in said chamber; and

a means for pumping a heat transfer fluid into said porous layer to maintain a pre-selected temperature for the liner.

22. (New) A system as recited in claim 21 wherein said pumping means is used to pre-heat said chamber.

23. (New) A system as recited in claim 21 wherein said pumping means is used to cool said reactor vessel.

24. (New) A system as recited in claim 21 wherein said pumping means is activated during converting of said reactant to cool said non-porous layer of said liner.

25. (New) A system as recited in claim 21 further comprising a means for recovering heat from said heat transfer fluid.

26. (New) A system as recited in claim 21 wherein said pumping means is used to cool said liner to remove said liner from said vessel.

27. (New) A system as recited in claim 21 wherein said converting means converts said reactant at a temperature of at least 374 degrees Celsius and a pressure of at least 25 bar.

28. (New) A system as recited in claim 21 wherein said converting means converts said reactant at a temperature of at least 374 degrees Celsius and a pressure of at least 220 bar.